

GAS CHEMISTRY CYCLING TO ACHIEVE HIGH ASPECT RATIO GAPFILL WITH HDP-CVD

ABSTRACT OF THE DISCLOSURE

5 A method and apparatus are disclosed for depositing a dielectric film in a gap having
an aspect ratio at least as large as 6:1. By cycling the gas chemistry of a high-density-plasma
chemical-vapor-deposition system between deposition and etching conditions, the gap may
be substantially 100% filled. Such filling is achieved by adjusting the flow rates of the
precursor gases such that the deposition to sputtering ratio during the deposition phases is
within certain predetermined limits.

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